

What is claimed is

1. An apparatus comprising a load limiting device configured for use with a vehicle safety restraint system, the load limiting device comprising a longitudinal member having spaced portions configured for connection with a vehicle safety restraint and a vehicle anchor point, respectively, so that forces applied to the safety restraint are applied to the longitudinal member, and the longitudinal member being plastically deformable in a predetermined manner when forces on the longitudinal member exceed the elastic limit of the longitudinal member.

2. The apparatus of claim 1, wherein the longitudinal member comprises a strip having a first end configured for connection to a vehicle occupant restraint and a second end configured for connection to the anchor point, the configuration of the strip between the first and second ends providing plastic deformation of the strip in a predetermined manner when forces on the strip exceed the elastic limit of the strip.

3. The apparatus of claim 2, wherein the longitudinal strip includes a predetermined pattern of perforations extending between the first and second ends of the strip, each perforation having a predetermined configuration, the pattern of the perforations and the configurations of the perforations providing the strip with its plastic deformation characteristics.

4. The apparatus of claim 3, wherein the longitudinal strip has a longitudinal axis and the perforations are formed in rows that extend transverse to the longitudinal axis of the longitudinal strip.

5. The apparatus of claim 4, wherein the perforations in each row are in staggered relation to the perforations of an adjacent row.

6. The apparatus of claim 5, wherein the longitudinal strip has solid portions between staggered rows of perforations and define beam-like segments between the rows of perforations, the beam like segments extending transverse to the longitudinal axis of the strip.

7. The apparatus of claim 6, wherein the longitudinal strip is formed of mild steel.

8. The apparatus of claim 3, wherein the pattern of the perforations causes deformation of the strip to be initiated at an intermediate portion of the strip and enables the deformation to propagate toward the ends of the strip.

9. The apparatus of claim 3, wherein the shape of the perforations and the pattern of the perforations create beam like segments in the strip, the beam like segments extending transverse to the longitudinal axis of the strip.

10. The apparatus of claim 1, wherein the longitudinal member comprises a tube having a first end configured for connection to a vehicle occupant restraint and a second end configured for connection to an anchor point of a vehicle, the configuration of the tube between the first and second ends providing plastic deformation of the tube in a predetermined manner when forces on the tube exceed the elastic limit of the tube.

11. The apparatus of claim 10, wherein the tube includes a predetermined pattern of perforations, wherein each perforation has a predetermined configuration, and wherein the pattern of the perforations and the configurations of the perforations provide the tube with its plastic deformation characteristics.

12. The apparatus of claim 11, wherein the longitudinal tube has a central axis, and the perforations comprise rings extending at least partially about the central axis of the longitudinal tube.

13. The apparatus of claim 12, wherein the perforations in each ring are staggered relative to the perforations of the adjacent ring.

14. The apparatus of claim 13, wherein the staggered rings of perforations define beam like ring segments between the rows of perforations, the beam like ring segments extending at least partially about the central axis of the longitudinal tube.

15. The apparatus of claim 14, wherein the longitudinal tube is formed of mild steel.

16. The apparatus of claim 13, wherein the pattern of the perforations causes deformation of the tube to be initiated in the ring like segments at an intermediate portion of the tube and enables the deformation to propagate longitudinally along the tube.

17. The apparatus of claim 13, wherein the shape of the perforations and the pattern of the perforations create beam like ring segments in the tube, the beam like ring segments extending at least partially about the longitudinal central axis of the tube.